

22. A kitchen ventilation system comprising:
 a sensor for detecting an operating parameter of a cooktop;
 an air moving device for displacing air from the cooktop;
 an air flow direction control device for directing air displaced by the air moving device between exhaust and recirculation flow paths; and
 control circuitry coupled to the sensor, to the air moving device and to the air flow direction control device for regulating operation of the air moving device and a position of the air flow direction control device based upon signals from the sensor, wherein operation of the control circuitry is configurable based upon site-specific factors of a site in which the ventilation system is installed.

23. The system of claim 22, wherein the sensor comprises at least one of a heated metal oxide gas sensor, an electro-chemical gas sensor, pellistors, a hot wire catalytic gas sensor, a semi-conductor gas sensor, a photo ionization smoke detectors, a thermal conductivity type gas sensor, an ultrasonic gas sensor, a UV flame sensor, an IR temperature sensor, a heat flux sensor and a air velocity sensor.

24. The system of claim 22, wherein the operating parameter is a chemical composition of air over an active zone of the cooktop.

25. The system of claim 24, wherein the chemical composition is selected from a group comprising of cooking fumes, vapors, smoke and combustion byproducts.

26~~75~~. The system of claim 22, wherein the operating parameter is temperature of air over the active zone of the cooktop.

27~~76~~. The system of claim 22, wherein the operating parameter is humidity of air over the active zone of the cooktop.

~~28~~²⁹. The system of claim 22, wherein the site-specific factors include at least one of hood width, site dimensions, installation location, height above the cooktop and type of fuel.

~~29~~²⁹. The system of claim 22, further comprising an air purification device for reducing content of the chemical composition in the displaced air.

~~30~~²⁹. The system of claim ~~28~~²⁹, wherein the air purification device is an active device.

~~31~~²⁹. The system of claim ~~28~~²⁹, wherein the air purification device is a corona discharge device.

~~32~~²⁹. The system of claim ~~28~~²⁹, wherein the air purification device is a UV air purification device.

~~33~~²⁹. The system of claim ~~28~~²⁹, wherein the air purification device comprises a filter to facilitate odor destruction and microorganism destruction.

~~34~~²⁹. The system of claim ~~28~~²⁹, wherein the air purification device comprises grease filter.

~~35~~³⁴. A kitchen ventilation system comprising:
 a sensor for detecting an operating parameter of a cooktop;
 an air displacement system including an air moving device for displacing air from the cooktop, and an air flow direction control device for directing air displaced by the air moving device between exhaust and recirculation flow paths; and
 control circuitry coupled to the sensor and to the air displacement system for regulating operation of the air displacement system based upon signals from the sensor and upon characteristics of the air displacement system to reduce acoustic noise of the ventilation system during operation.

36 ~~36~~³⁵. The system of claim ~~34~~³⁵, wherein the sensor comprises at least one of a heated metal oxide gas sensor, an electro-chemical gas sensor, pellistors, a hot wire catalytic gas sensor, a semi-conductor gas sensor, a photo ionization smoke detectors, a thermal conductivity type gas sensor, an ultrasonic gas sensor, a UV flame sensor, an IR temperature sensor, a heat flux sensor and a air velocity sensor.

37 ~~36~~³⁵. The system of claim ~~34~~³⁵, wherein the operating parameter is a chemical composition of air over an active zone of the cooktop.

38 ~~37~~³⁵. The system of claim ~~36~~³⁵, wherein the chemical composition is selected from a group comprising of cooking fumes, vapors, smoke and combustion byproducts.

39 ~~38~~³⁵. The system of claim ~~34~~³⁵, wherein the operating parameter is temperature of air over the active zone of the cooktop.

40 ~~39~~³⁵. The system of claim ~~34~~³⁵, wherein the operating parameter is humidity of air over the active zone of the cooktop.

41 ~~40~~³⁵. The system of claim ~~34~~³⁵, wherein the characteristics of the air displacement system comprises a set of operating set point references for the air displacement system.

42 ~~41~~³⁵. The system of claim ~~34~~³⁵, wherein the characteristics of the air displacement system comprises a set of operating cycle timing references for the air displacement system.

43 ~~42~~³⁵. The system of claim ~~34~~³⁵, wherein the characteristics of the air displacement system comprises a ventilation rate look-up table for the air displacement system.